Supplementary Material

Pre-scan training session questionnaire

Methods

After each of the four experimental condition of the pre-scan training session we asked the participants to rate the strangeness of the sensation (Q1), the feeling of widening of the finger (Q2), the feeling of numbness (Q3), the feeling that the two index fingers merged into one big finger (Q4), and the feeling of owning the other person's finger (Q5). Rating was performed on a scale from 1 (no effect) to 5 (strong effect).

For each participant independently, we first computed the individual mean and standard deviation of the responses across all the experimental conditions and questions. Then, data were ipsatized to neutralize the effect in responses set and to transform the questionnaire scores in Z-distributed values, allowing the use of parametric statistical tests (Cattell, 1944; Broughton and Wasel, 1990). Ipsatization was computed by subtracting the mean value and dividing the demeaned scores by the standard deviation. One subject was excluded from this analysis because he equally rated all conditions and questions, and such lack of variance made impossible to ipsatize the values.

For each question, the ipsatized ratings were analyzed by means of a 2-way repeated measures analysis of variance (ANOVA) with Agent (self, other) and Synchrony (synchronous and asynchronous) as within-subject factors. Post-hoc

analyses were conducted using the Tukey Honestly Significant Difference (HSD) test thresholded at $p<0.05$.

Results

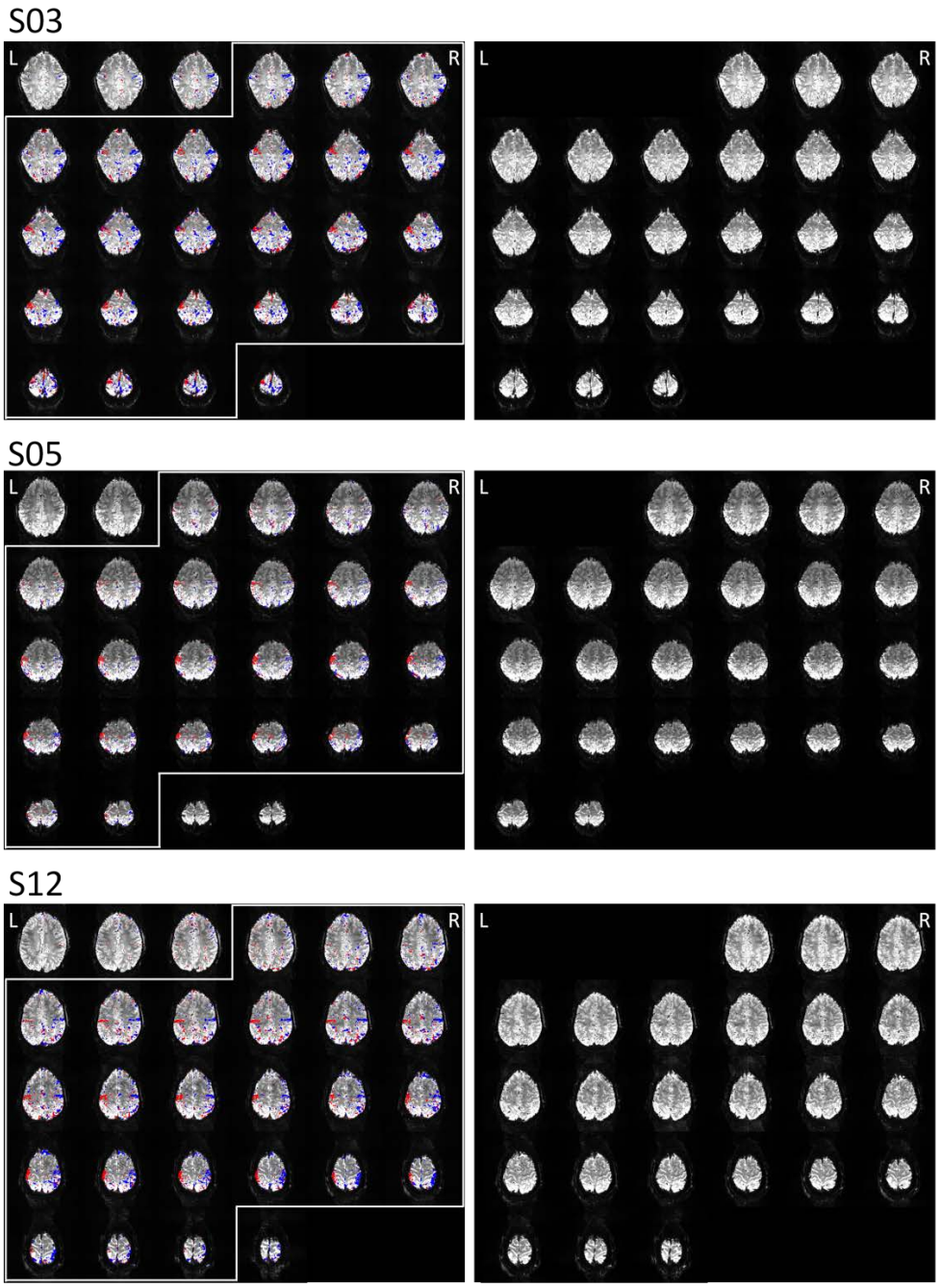
The average ratings for the five questions in the four experimental conditions are displayed in Supplementary Fig. 4.

The ANOVA on Q1 (strangeness of the sensation) showed a main effect of the Agent ($F_{1,10}=17.7$, $p<0.002$), with the self stroking leading to a stranger sensation. The analysis of Q2 (feeling of widening of the finger) showed a main effect of the agent ($F_{1,10}=7.6$, $p<0.020$), with the self stroking leading to a feeling of a having a wider finger, and of synchrony ($F_{1,10}=21.8$, $p<0.001$) with the synchronous stroking leading to a feeling of a having a wider finger. More importantly, the Agent×Synchrony interaction was also significant ($F_{1,10}=10.6$, $p<0.009$). Post-hoc analysis showed that the self-synchronous stroking induced higher rating compared to all the other conditions (all $p<0.001$), and no difference was observed between the ratings of the other three experimental conditions (all $p>0.09$). The analysis of Q3 (feeling of numbness) showed only a main effect of synchrony ($F_{1,10}=6.6$, $p<0.028$) with the synchronous stroking leading to a stronger numbness sensation. The analysis of Q4 (feeling that the two index fingers merged into one big finger) did not show any significant effect. Finally, the analysis of Q5 (feeling of owning the other person's finger) showed a significant Agent×Synchrony interaction ($F_{1,10}=11.2$, $p<0.008$), with a significantly different rating between the self- and other-synchronous condition ($p<0.03$) but not between the self- and other-asynchronous condition ($p=0.064$).

References

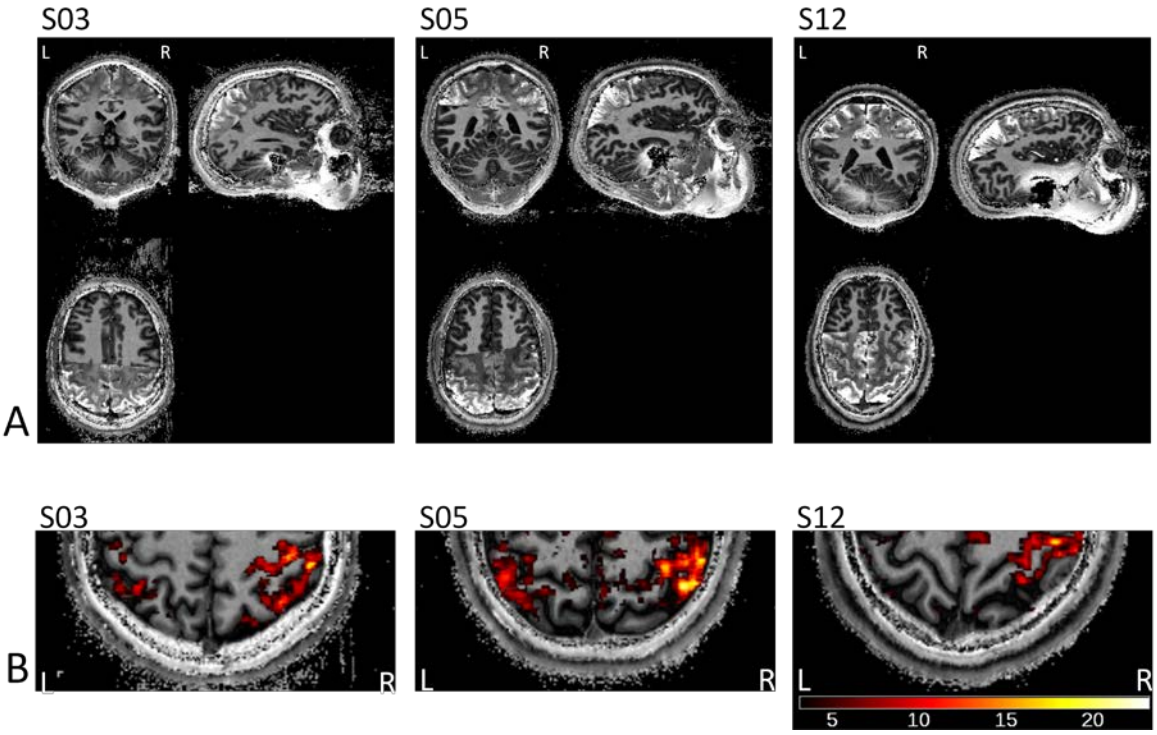
Broughton, R. & Wasel, N. (1990) 'A Text-Stimuli Presentation Manager for the Ibm Pc with Ipsatization Correction for Response Sets and Reaction-Times', *Behavior Research Methods Instruments & Computers*, **22**(4), pp. 421-423.

Cattell, R. B. (1944) 'Psychological measurement: normative, ipsative, interactive', *Psychological Review*, **51**(5), pp. 292-303.

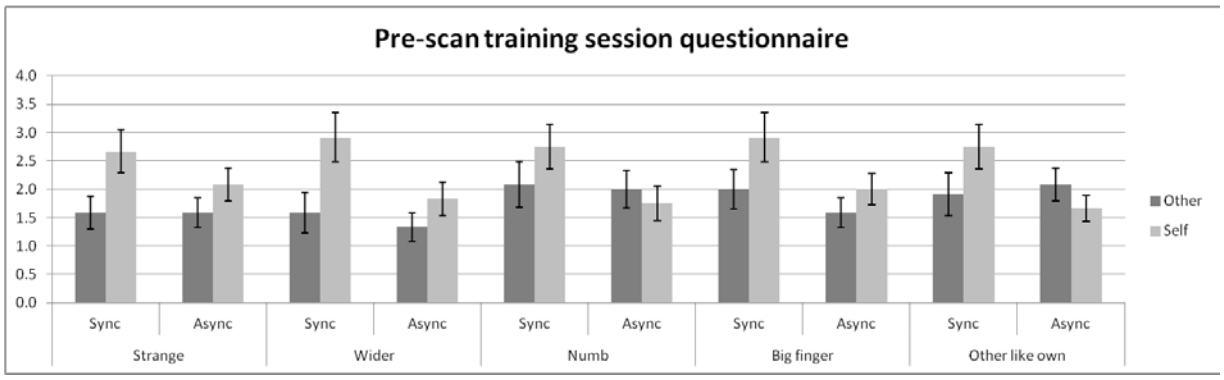


Supplementary Figure 1: Slice selection for the finger mapping (left panels) and for the illusion (right panels) runs in three representative subjects. The thresholded F-contrast ($p<0.001$) for the right (in red) and left (in blue) finger mapping have been overlaid on the slices of the finger mapping runs. The white box in the left panels highlights the slices selected for the illusion runs.

Supplementary Figure 2: Masks of BA 3b, 1, and 2 for three representative subjects overlaid to their relative MP2RAGE image.



Supplementary Figure 3: A: EPI and anatomical correspondence in three representative subjects. B: Results of the single subject analysis (Self-Synchronous condition thresholded at $p<0.001$ uncorrected) for three representative subjects; color bar indicates the t- values. In all panels images are not normalized and shown in neurological convention.



Supplementary Figure 4: Results of the pre-scan training session questionnaire. The ANOVA revealed an Agent×Synchrony interaction only for the feeling of widening of the finger and for the feeling of owning the other person's finger.